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***ELEUTHERODACTYLUS BEARSEI* NEW SPECIES  
(ANURA: LEPTODACTYLIDAE)  
FROM NORTHEASTERN PERU**WILLIAM E. DUELLMAN<sup>1</sup>

**ABSTRACT** *Eleutherodactylus bearsei*, belonging to the *Eleutherodactylus unistrigatus* group, is named from the Río Huallaga Drainage in the upper Amazon Basin near the base of the Andes in the Departamento San Martín, Peru. *Eleutherodactylus bearsei* is most similar to *E. diadematus* and *E. platydactylus*, allopatric species in the Amazon Basin and Andean slopes of the Andes in central and southern Peru, respectively.

**RESUMEN** *Eleutherodactylus bearsei*, perteneciente al grupo *Eleutherodactylus unistrigatus*, se describe del drenaje del Río Huallaga en la parte superior de la cuenca amazónica cerca de la base de los Andes en el Departamento de San Martín, Perú. *Eleutherodactylus bearsei* es más similar a *E. diadematus* y *E. platydactylus*, especies alopátricas en la cuenca amazónica y las vertientes de los Andes en las partes central y meridional del Perú, respectivamente.

**Key words:** Leptodactylidae, *Eleutherodactylus bearsei* new species, Amazonian Peru.

Included in the collections of anuran amphibians made by a field party from The University of Kansas in the Departamento San Martín in northeastern Peru in 1989 were several new species. Some of these have been described—*Ischnocnema saxatilis* (Duellman, 1990), an *Eleutherodactylus* (Duellman, 1992), and eight species of centrolenids (Duellman and Schulte, 1992). To these may be added another species of *Eleutherodactylus*. In the following description, the terminology, method of measurements, and numbered characters in the diagnosis follow Lynch and Duellman (1980); snout-

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vent length is abbreviated SVL. The Museum of Natural History, The University of Kansas is abbreviated KU.

I take pleasure in naming this distinctive new species for Professor Robert C. Bearse, Associate Vice Chancellor for Research, Graduate Studies, and Public Service, The University of Kansas; his enlightened and imaginative administrative actions have continuously enhanced the programs of the Museum of Natural History.

### *Eleutherodactylus bearsei* new species

**Holotype.**—KU 212268, a gravid female, from the Cataratas Ahuashiyacu (06°30'S, 76°20'W, 730 m), 14 km (by road) northeast of Tarapoto, Provincia San Martín, Departamento San Martín, Peru, obtained on 8 February 1989 by William E. Duellman.

**Paratypes.**—KU 212269–71 and 212273, three adult males and one gravid female, collected with the holotype.

**Referred specimens.**—KU 212272, a subadult female, and 212274 and 217314–15, juveniles, from the type locality; KU 212275–76, juveniles, from 30 km (by road) southwest of Zapatero (ca. 10 km NE of San José de Sisa), 500 m, Provincia Lamas, Departamento San Martín, Peru.

**Diagnosis.**—A member of the *Eleutherodactylus unistrigatus* group, as defined by Lynch (1976), characterized by: (1) skin of dorsum shagreened (scattered low tubercles in males), lacking folds; skin on venter areolate; (2) tympanum distinct, vertically ovoid, its diameter about one-third diameter of eye; (3) snout acutely rounded in dorsal view, bluntly rounded in profile; canthus rostralis sharp; (4) upper eyelid broader than interorbital distance, not bearing tubercles; cranial crests absent; (5) vomerine dentigerous processes prominent, transverse; (6) males with vocal slits and subgular vocal sac; nuptial excrescence absent; (7) first finger shorter than second; discs truncate, largest on Fingers II–IV; (8) fingers bearing lateral keels; (9) ulnar tubercles diffuse; (10) low tubercles on tarsus; tubercles absent on heel; (11) two metatarsal tubercles; inner elliptical, 8–10 times size of outer tubercle; (12) toes unwebbed, bearing narrow lateral keels and toepads nearly as large as those on outer fingers; (13) dorsum brown with darker brown marks on back and transverse bars on limbs; posterior surfaces of thighs and flanks uniform brown; dark brown labial bars; venter brown with cream flecks; (14) adults moderate-sized; three males 22.7–25.5 mm SVL, two females 38.0 and 38.8 mm SVL.

*Eleutherodactylus bearsei* most closely resembles *E. platydactylus* from the Amazonian slopes of the Andes in central and southern Peru, *E. diadematus* in the upper Amazon Basin, and a new species from Panguana in Amazonian Peru being described by Hedges and Schlüter. *Eleutherodactylus platydactylus* differs from *E. bearsei* by having larger, conical tubercles on the dorsum,

distinct scapular ridges, tubercles on the heels, and the venter pigmented only on the throat. *Eleutherodactylus diadematus* and the new species from Panguana differ by having cream flanks with distinct diagonal dark marks and a cream venter with brown mottling. Furthermore, the new species from Panguana is smaller (males 18.2–23.6 mm; females 33.5–35.3 mm) and has an elongate distal tarsal tubercle (absent in *E. bearsei*).

**Description.**—Three adult males, two adult females. Head about as wide as body, about as long as wide; head width 35.2–40.1% ( $\bar{x}$  = 38.2) of SVL in males, 39.4–42.3% ( $\bar{x}$  = 40.9) in females; head length 37.0–39.6% ( $\bar{x}$  = 38.5) of SVL in males, 39.9–41.6% ( $\bar{x}$  = 40.8) in females; snout moderately short, not protruding beyond margin of lip, round in dorsal view, bluntly rounded in profile; eye-nostril distance slightly less than length of eye in males, about equal in females; eye-nostril distance 28.7–30.9% ( $\bar{x}$  = 29.1) of head length in males, 27.7–30.4% ( $\bar{x}$  = 29.1) in females; eye large, prominent, its length 34.0–38.3% ( $\bar{x}$  = 35.8) of head length in males, 27.2–29.0% ( $\bar{x}$  = 28.1) in females; upper eyelid lacking tubercles, broader than interorbital distance, its width 108.2–116.0% ( $\bar{x}$  = 111.0) of interorbital distance in males, 123.5–128.1% ( $\bar{x}$  = 125.8) in females. Top of head flat; cranial crests absent; canthus rostralis shallowly sigmoid, sharp; loreal region concave; lip slightly flared anterior to orbit; internarial area depressed; nostril ovoid, slightly protruding laterally at point above anterior margin of lower jaw. Supratympanic fold diffuse, curving posteroventrally from posterior corner of orbit, obscuring posterodorsal part of low tympanic annulus; tympanum vertically ovoid, separated from eye by distance much greater than diameter of tympanum, which is 30.3–35.3% ( $\bar{x}$  = 32.3%) of diameter of eye in males, 31.1–37.2% ( $\bar{x}$  = 34.2) in females. Choanae ovoid, widely separated, not obscured by palatal shelf of maxillary arch; vomerine denticerous processes prominent, transverse, posteromedial to choanae, widely separated medially, each bearing three or four ( $\bar{x}$  = 3.2) teeth in males, four or five ( $\bar{x}$  = 4.3) teeth in females. Tongue cordiform, distinctly notched posteriorly, free behind for about one third of its length; vocal slit elongate, extending from midlateral base of tongue toward angle of jaws; vocal sac single, median, subgular.

Skin on dorsum shagreened with scattered low tubercles in males; dermal folds absent; flanks smooth; a few prominent tubercles posteroventral to tympanum; five or six low tubercles on ventrolateral surface of forearm; three or four tubercles on both inner and outer surface of tarsus; tubercles absent on heel; skin on belly weakly areolate, that on posteroventral surfaces of thighs granular; other ventral surfaces smooth; discoidal fold evident only posteriorly. Cloacal opening unmodified, directed posteroventrally at upper level of thighs.

Forearms moderately robust; fingers moderately short, slender, bearing narrow lateral keels and truncate discs, much wider on Fingers II–IV than on Finger I; relative lengths of fingers I < II < IV < III; subarticular tubercles

subconical; few large supernumerary tubercles on proximal segments; palmar tubercle large, bifid; thenar tubercle large, broadly ovoid, slightly elevated (Fig. 1); males lacking nuptial excrescences. Hind limbs moderately robust; heels barely overlapping when hind limbs flexed at right angles to axis of body; tibia length 53.7–59.5% ( $\bar{x}$  = 56.4) of SVL in males, 49.7–50.5% ( $\bar{x}$  = 50.1) in females; foot length 43.2–48.9% ( $\bar{x}$  = 46.6) of SVL in males, 46.3–46.9% ( $\bar{x}$  = 46.6) in females. Inner tarsal fold absent; inner metatarsal tubercle elliptical, eight to ten times size of subconical outer metatarsal tubercle; toes long, slender, bearing narrow lateral keels and truncate discs; those on Toes III–IV nearly as large as those on outer fingers; toes unwebbed; relative lengths of toes  $I < II < III < V < IV$ ; subarticular tubercles round; supernumerary tubercles diffuse, present only on proximal segments (Fig. 1).

*Color in preservative:* Dorsum of head, body, and limbs dull brown with indistinct darker brown markings consisting of narrow interorbital bar, W-shaped mark in scapular region, and one or two small middorsal blotches

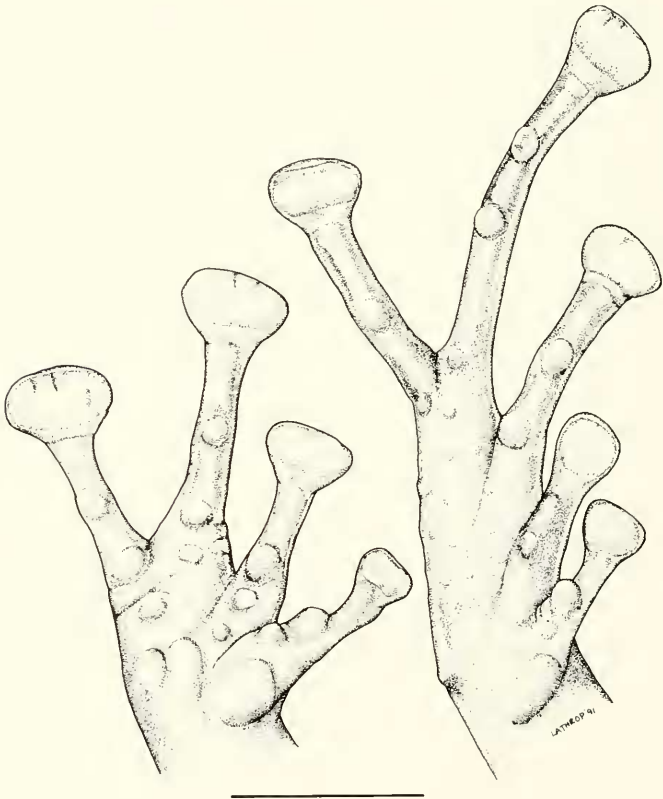


Fig. 1. Hand and foot of *Eleutherodactylus bearsei*, KU 212273. Scale = 5 mm.

posteriorly on body; two males and one subadult female with square tan spot anterior to interorbital bar and large, square tan spot posterior to sacrum. Dorsal surfaces of limbs with transverse dark brown bars—one on upper arm, one or two on forearm, four each on thigh and shank, three on tarsus; digits also barred; posterior surfaces of thighs brown. Flanks brown with small, diffuse cream spots ventrally; one brown bar on lip just posterior to level of nostril; three diagonal brown bars below orbit. Venter brown with cream flecks in larger individuals, cream with brown reticulations in smaller individuals, and cream with brown flecks in small juveniles.

*Color in life:* Dorsum dull brown with faint, darker brown markings; posterior surfaces of thighs dark gray; venter dark gray with bluish white flecks; iris dull grayish bronze with brown flecks and horizontal brown bars; some individuals with pale creamy orange spot on head and another on dorsum posterior to sacrum (Fig. 2).

*Measurements* (in mm: 3 males followed 2 females with means in parentheses): SVL 22.7–25.5 (24.0), 38.0–38.8 (38.4); tibia length 12.2–14.3 (13.5), 19.2–19.3 (19.3); foot length 9.8–12.2 (11.2), 17.6–18.2 (17.9); head width 8.0–10.4 (9.2), 15.3–16.1 (15.7); head length 8.6–9.7 (9.2), 15.5–15.8 (15.7); interorbital distance 2.3–2.5 (2.4), 3.2–3.4 (3.3); eyelid width 2.5–2.9 (2.7), 4.1–4.2 (4.2); eye-nostril distance 2.6–3.0 (2.8), 4.3–4.8 (4.6); eye diameter 3.2–3.4 (3.3), 4.3–4.5 (4.4); tympanum diameter 1.0–1.2 (1.1), 1.4–1.6 (1.5).

**Distribution and ecology.**—*Eleutherodactylus bearsei* is known from two streams at elevations of 500 and 730 m on ridges extending from the Andes into the Amazon Basin in Departamento San Martín in northeastern Peru. These ridges support lower montane humid forest (Tosi, 1960). Adults were found at night on mossy boulders at the edges of streams in deep ravines; juveniles were on low herbs or ferns near the streams. No calls were associated with this species.

**Remarks.**—The type locality is northeast of Tarapoto on the road to Yurimaguas; it is a rocky gorge into which two streams plunge. The sides of the gorge are nearly vertical rock walls, and the floor of the gorge is littered with huge boulders, many of which support thin layers of moss. Small ferns and herbs grow on some of the boulders, and small trees, ferns, and a variety of herbs grow in patches of soil on the floor of the gorge. At this locality, three other species of frogs (*Cochranella* sp., *Eleutherodactylus* sp., and *Hyla phyllognatha*) were active on boulders at night and three others (*Atelopus pulcher*, *Colostethus nexipus*, and *Epipedobates bassleri*) were active there by day. The arboreal *Osteocephalus verrucigerus* and stream-edge *Leptodactylus wagneri* were active at night. The second locality is a wooded, boulder-strewn ravine with a cascading stream on the road from Cuñubucque (just east of the Moyobamba-Tarapoto Road) to San José de Sisa. *Ischnocnema saxatilis* and *Leptodactylus rhodonotus* were found in the ravine at night, and

*Bufo typhonius* and two species of *Colostethus* were active in the ravine by day.

Phenotypically, *E. bearsei* can be grouped with *E. diadematus*, *E. platycephalus*, and an undescribed species from Panguana, all of which occur in the upper Amazon Basin and on the lower Andean slopes in Peru. The



Fig. 2. *Eleutherodactylus bearsei*: Top—KU 212268, holotype, female, 38.0 mm SVL. Bottom—KU 212269, paratype, male, 22.7 mm SVL.

similarity of *E. bearsei* to *E. diadematus* suggests that *E. bearsei* may be an Andean foothill vicariant of the Amazonian *E. diadematus*. A similar pattern seems to exist within *Ischnocnema* with *I. quixensis* in the Amazon Basin and *I. saxatilis* in the foothills (Duellman, 1990).

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